September 9, 1975

Dr. Martin Kaplan
World Health Organization
1211 Geneva 27
Switzerland

Dear Martin,

I did just receive in the mail the publication of the 5th report on the world health situation and the xeroxed material on research management and so on. I will be studying this carefully and you may be hearing more from me about that.

I did just want to drop you a note about my own reading of the literature on composting and fecal waste disposal. It is ironic that while many developing countries seem to be stalled on problems of investment in hydrolic disposal, that advanced countries are more and more looking to composting of sewage sludges as an ultimate method of disposal!

It does look as if Gotas' 1956 monograph (WHO #31) leaves little to be improved upon at the present time, but there has been a real burst of activity in this country in studies supported by EPA and so on on the dissemination of this idea for municipal sewage sludge applications.

At the same time I do not see much reference to these traditional methods in the reports that I had seen so far from WHO on community water supplies and so forth. Am I just missing the appropriate material or is somebody else on the wrong boat?

As far as I can tell, the only authenticated mechanism for disinfection is the rise in temperature in the compost heap and this does give me some cause for concern if it is not routinely monitored, espacially with respects to parts of the deposit that may be added most recently and may not reach the high temperatures of the center. The question of calculated inoculation of the composts was looked at in a rather superficial way by Gotas some years ago, and he came to the conclusion that the requisite microorganisms were always present. He had really no way to look into whether there were any shortcomings with respect to the optimization of the process, but he may well be right.

However, these studies have to do with more or less optimally designed compost heaps that include the necessary amount of straw or similar refuse to furnish the oxidizable carbohydrate for thermogenic bacterial oxidation. These systems will break down if the compost heaps are not carefully tended and turned over or if they do not have the approporiate admixture of cellulose or similar fiber and other organic waste. So, I suspect there is still some

room for inquiry about recommended procedures in different habitats.

I am also far from convinced that thermogenesis is the whole story in disinfection since the most prevalent organisms found in the compost are exactly the ones that we use for antibiotic production. In this resepect, and in respect to the most rapid oxidation of insoluble carbohydrate there may well be some room for more calculated manipulation of the flora.

One point that surprised me a little, that Gotas made quite strongly, is that urine contributes just about as much nitrogen as feces on a daily basis. There evidently are some sites where separate collection of urine and feces is then used to get the most efficient recovery of fixed nitrogen for fertilizer purposes. But again, this is something that there is not much comment on in any recent literature that I have seen.

At any rate, the somewhat ironic conclusion is that vastly more work seems to be being done now on the best procedures for the composting of human wastes in the advanced country context and that not enough use may be being made of this approach in organizing the sanitation of underdeveloped countries. So, I would be glad to be brought up to date on WHO's current activities in this general field and if not enough has been going on, there would be an obvious basis to recommend reconvening the appropriate expert committees. It does seem to me that there could be very large savings in investment to move away from pipelining waste from one place to another where they still have to be dealt with and to focus instead on proper local disposal.

I have not yet finished my thinking about the other side of the problem which is to say biological self-purification of water supplies, but I do not have any particularly good leads on that just yet.

Sincerely yours,

Joshua Lederberg
Professor of Genetics

JL/rr